

NOTES ON BRAZILIAN POLYGALACEAE

John J. Wurdack

U. S. National Herbarium, Smithsonian Institution

POLYGALA OPTIMA Wurdack, sp. nov.

In systemate Chodatii P. spectabili DC. affinis, foliis obovato-oblongis vel oblongo-ellipticis apice plerumque obtuso vel rotundato inflorescentiae bracteis brevioribus differt.

Suffrutex 15-30 cm altus unicaulis vel e basim 1-3-caulis; caulis striatus sparse pilis incurvis 0.1-0.2 mm longis obsitus glabrescens inferne lignosus; folia crassiuscula (3.5-)5-10 (11.5) X (1.5-)2.5-6 cm obovato-oblonga vel oblongo-elliptica, apice obtuso vel rotundato minute (0.2-0.3 mm) apiculato, basi cuneata et in petiolum indistinctum usque ad basim decurrentia, sparse vel modice ciliolata (ciliis 0.1-0.2 mm longis gracilibus) alioqui glabra vel subglabra (costa supra et subtus interdum pilis perpaucis oblecta), nervis primariis utrinque 10-12 ascendentibus costaque subtus crassiusculis nervulis inconspicuis; stipulae cornigeræ 0.5-0.8 X 0.5-0.7 mm truncatae. Racemi 5-11 cm longi grandiflori axe sicut pedicellis sepalis exterioribusque sparse inconspicueque puberuli, pilis gracilibus incurvis ca. 0.1 mm longis, bracteis plerumque 1-2 mm longis lanceatis deciduis, spineis cornigeris 0.7-0.9 X 0.4 mm conico-cylindricis truncatis. Pedicelli 5-10 mm longi; sepala exteriora libera sparse ciliolata suborbicularia rotundata duo 3.5 X 2.7-3 mm subplana uno 6 X 7 mm naviculare; alae minute papillose 13-15 X 12-13.5 mm ovato-orbiculares, apice paulo retuso, margine glabro. Petala lateralia glabra ca. 25 X 2-3.5 mm, apice rotundato; carina ca. 19 mm longa glabra. Stylus ca. 15 mm longus basaliter per 10 mm 0.3 mm latus apicem versus 1 mm latus et curvatus ad stigmata 1.5 mm latus, stigma inferiore includens; capsula 9 X 8 mm obcordata glabra; seminis corpus 5 X 2.5 mm, carunculo terminali 1.2 mm alto, appendice dorsali 4 X 1.2 mm semen 2/3 aequante.

Type Collection: H. S. Irwin, R. Souza, & R. Reis dos Santos 10816 (holotype US 2530401; isotype NY), collected in cerrado ca. 15 km south of Corumbá de Goiás, Serra dos Pirineus, Goiás, Brazil, elev. 1000 m, 30 Nov. 1965. "Fleshy herb ca. 15 cm tall. Calyx purplish green; corolla cream, apically yellow; fruiting calyx deep purple."

Paratypes (all Brazil): Distrito Federal (elev. 700-1225 m): Irwin & Soderstrom 6156, from Catetinho; Irwin & Soderstrom 5725, from 15 km east of Brasília; Irwin, Souza, & dos Santos 9017, from 1.5 km east of Sobradinho; Irwin, Souza, & dos Santos 10108, from 3 km north of Sobradinho; Irwin, Souza, & dos Santos 10583, from 12 km east of Brasília. Goiás (elev. 800-1150 m): Irwin & Soderstrom 7512, from Serra do Caiapó ca. 60 km south of Caiaponia; Irwin, Souza, & dos Santos 10565, from Serra do Rio

Prêto 3 km east of Cabeceiras; Irwin, Grear, Souza, & dos Santos 13826, from Serra dos Cristais ca. 25 km south of Cristalina; Irwin, Grear, Souza, & dos Santos 14245, from Serra Geral de Goiás ca. 35 km north of Formosa; A. Macedo 4785 (US), from Anápolis; Irwin, Maxwell & Wasshausen 19367, from Pico dos Pirineus. Minas Gerais: A. Macedo 4290, from Uberlândia.

Polygala spectabilis has thinner acuminate leaves, well-defined petioles 0.3-0.5 cm long, and subulate inflorescence bracts 3-8 mm long. Polygala autranii Chodat (isotype NY) has fine-setulose (hairs 0.4-0.5 mm long) stems and leaves, as well as inflorescence glands narrowly cylindric and 1.5 mm long. All other species in Sect. Ligustrina except P. anatina Chodat have smaller flowers and/or acuminate leaves; that Peruvian exception (from the description and type photo) has obtusish leaves and large flowers, but ciliate alae, narrowly cylindric inflorescence glands 1 mm long, and a projecting lower stigma. It is somewhat surprising that such an abundantly collected species as P. opima has not heretofore been described, but the foliar character seems definitive.

POLYGALA HEBECLADA DC. var. IMPENSA Wurdack, var. nov.

Foliorum laminae anguste ovatae vel ellipticae 2-5 X 1.3-2.4 cm. Floris alae 8.5-9 mm longae.

Type Collection: H. S. Irwin, R. Souza, & R. Reis dos Santos 10449 (holotype US 2530423; isotype NY), collected in cerrado ca. 8 km east of Cabeceiras, Serra do Rio Prêto, Goiás, Brazil, 16° S, 47° W, elev. 1000 m, 18 Nov. 1965. "Erect herb to 40 cm tall. Outer perianth greenish violet without, lavender within; inner perianth lavender-purple."

Paratypes (both Goiás): Irwin & Soderstrom 7367, from ca. 50 km. south of Caiapônia on road to Jataí, Serra do Caiapó, elev. 800-1000 m; Irwin, Souza, & Reis dos Santos 10780, from ca. 14 km. south of Corumbá de Goiás, Serra dos Pirineus, elev. 975 m.

The typical variety of P. hebeclada and the minor departures described by Chodat have linear to lance-linear leaves to about 0.5 cm wide and alae 5-6.5 mm long (i.e. only about $\frac{1}{2}$ the area in var. impensa). Despite this gigantism, no qualitative difference in floral structure is noticeable.

Certainly, two species are involved in P. hebeclada sensu Chodat, one with short erect pedicels even in fruit, the other with longer slender pedicels recurved in fruit. From the Macbride photographs, the former is P. hebeclada DC. (left-hand sprig in Macbride photo 34962, annotated -- fide Macbride -- by Candolle. The central sprig in this photograph also seems to be P. hebeclada, although apparently a part of the St. Hilaire collection of P. hyssopifolia St. Hil. & Moq., while the right-hand branchlet shows pendulous pedicels). In publishing P. hyssopifolia in 1828, St. Hilaire and Moquin cited P. hebeclada (published in 1824) as a synonym; the following year in Flora Brasiliae Meridionalis, they synonymized P. hyssopifolia under P. hebeclada. St. Hilaire and Moquins' name of 1828 thus

is illegitimate, quite apart from the probable species mixture in St. Hilaire's collection. If my interpretation of P. hebeclada is correct, the next available name for the cernuous-fruited species is P. rhodoptera Mart. ex Bennett (placed by Chodat in synonymy under P. hebeclada). Polygala hebeclada and P. rhodoptera are sympatric, ranging from Goiás and Mato Grosso to Paraná in Brazil and eastern Bolivia.

POLYGALA IRWINII Wurdack, sp. nov.

In habitu P. bracteatae A. W. Benn. et P. cuspidatae DC. affinis inflorescentiae bracteis terminalibus ellipticis differt.

Caulis 30-45 cm altus inferne plerumque simplex ad apicem ipsum multiramis apicem versus angulatus et paulo alatus primum sicut inflorescentiae axis sparse puberulus pilis 0.1 mm longis erectis glabrescens. Folia numerosa inferne 4-verticillata et obovato-oblonga superne alterna et elliptica vel oblongo-elliptica (1-)2-2.5(-3.5) X (0.5-)0.8-1.2(-1.5) cm, apice late acuto vel obtuso, basi late acuta mucronata (mucro acutissimo 0.3-0.4 mm longo), breviter (0.5-0.8 mm) alatopetiolata modice pellucido-punctata sparsissime caduceque ciliolata (ciliis 0.05-0.1 mm longis), venis secundariis utrinque ca. 6 inconspicuis. Racemi numerosi densiflori plerumque 1.5-3 X 1-1.5 cm, pedunculis ca. 1 cm longis; bractee caulinae terminales abaxiales 1.7-3 X 1-1.6 mm ovato-ellipticae, apice hebeti-acuto, adaxiales 0.7-1.3 X 0.3-0.5 mm lanceatae. Pedicelli ca. 0.3 mm longi; sepala exteriora libera sparse ciliolata orbiculari-ovata sparse croceo-maculata, apice lato vel hebeti-obtuso, duo 1.7-1.9 X 1.6-1.7 mm, uno 2.2 X 1.9 mm; alae 5 X 3.3 mm obovato-ellipticae modice croceo-maculatae glabrae, apice rotundato non cuspidato. Petala lateralia 4 X 1.7-1.9 mm glabra, apice per 2.5 mm libero rotundato; carina (crista exclusa) ca. 3.5 mm longa, crista e flabellis duobus 0.5-0.8 mm longis paulo (0.2 mm) lobulatis composita. Styli pars gracilis ca. 0.8 mm longa, apice expanso 0.9 X 0.8 mm, stigmatibus supero ca. 0.5 mm eminente infero semi-incluso. Capsula 2.8 X 1.6 mm oblonga glabra croceo-maculata; semina (carunculo excluso) 2.3 X 0.8 mm cylindracea nigra sparse pilis minutis praedita, carunculo terminali 0.6 mm alto, appendicibus descendentibus 1.8 mm longis ca. 0.5 mm quam semine brevioribus.

Type Collection: H. S. Irwin, J. W. Grear, Jr., R. Souza, & R. Reis dos Santos 16847 (holotype US 2530414; isotype NY), collected in cerrado ca. 87 km north of Xavantina, Serra do Roncador, Mato Grosso, Brazil, elev. 550 m, 2 June 1966. "Herb to ca. 30 cm tall. Perianth pale green. Fruit green. Frequent."

Paratypes (both Mato Grosso): Irwin, Grear, Souza, & Reis dos Santos 16275, from cerrado, Rio Turvo ca. 210 km north of Xavantina, Serra do Roncador; Hatschbach 32027 from S. José da Serra (mun. Cuiaba).

In both related species, the abaxial of each subtending bract pair is narrowly lanceate and 2.5-5 X 0.4-1 mm, the terminal part of the inflorescence thus being conspicuously comate; in all material examined of P. cuspidata sensu Chodat,

the crest is of 2-3 pairs of lobes, rather than the one pair found in P. irwinii. Perhaps P. bracteata and P. cuspidata are synonymous, Chodat not having seen the Pohl syntypes of Bennett's species. Bennett had synonymized P. cuspidata under P. timoutou Aubl., apparently without seeing the type in the Geneva herbarium, and described P. comata Mart. ex Benn. which Chodat synonymized under P. cuspidata. Regardless of the distinctness from one another of these earlier-published species, P. irwinii is certainly not equatable with any of them. Polygala hygrophiloides S. Moore differs (ex descr. and photo) from P. irwinii at least in the smaller stature (ca. 15 cm), smaller (2 X 0.4-0.7 cm) lanceate leaves, long-pedunculate (to 6 cm) racemes, and appendage only 1/3 as long as the seed. Cardenas 4561 (US), from between San Micerato and Santiago de Chiquitos, Bolivia, resembles P. irwinii in inflorescence bracts, but differs in the relatively narrower leaves, longer racemes, and bilobed crest; this Bolivian material was distributed as P. cuspidata, but is rather probably undescribed.

POLYGALA VITELLINA Wurdack, sp. nov.

In systemate Chodatii ut videtur P. subtili H.B.K. distanter affinis, floribus maioribus flavidis differt.

Herba glabra 20-35 cm alta apicem versus pauciramosa. Folia alternata remota 2-4 X 0.3-0.5 mm oblongo-linearia tenuia sicut caulis inconspicue guttulis aureis obsita. Inflorescentia capitata 0.8-1.5(-2) X 0.7-0.8 cm, apice vix comato, bracteolis 0.6-0.8 X 0.2-0.4 mm lanceatis caducis adaxialibus non guttatis abaxialibus sparse aurantiaco-maculatis, pedicellis 0.5-0.7 mm longis. Sepala exteriora obtusa anguste elliptica vel elliptico-ovata basin versus sparse croceo-maculata, duo 1 X 0.4-0.5 mm, uno 1.4-1.5 X 0.8-0.9 mm; alae oblongo-ellipticae (apice obtuso) 2.9-3 X 1.3 mm trinervatae apicem versus sparse croceo-maculatae. Petala lateralia 2.3-2.5 X 0.7 mm carinae cristam paulo superantia, apice rotundato; carinae pars libera (crista exclusa) ca. 0.6 mm longa croceo-maculata, cristae flabellis 4 hebetibus 0.4 mm longis composita. Stigma superum penicillatum, inferum tuberculatum; styli pars infera 0.6 mm longa, pars expansa 0.4 mm longa; ovarium obconicum croceo-maculatum; capsula oblongo-obovata 1.5 X 0.8 mm; semina 0.6 X 0.35 mm ovato-ellipsoidea minutissime apiculata nigra glabra exappendiculata.

Type Collection: H. S. Irwin, J. W. Grear, Jr., R. Souza, & R. Reis dos Santos 16314 (holotype US 2530417; isotype NY), collected at gallery margin ca. 86 km north of Xavantina, Serra do Roncador, Mato Grosso, Brazil, elev. 550 m, 31 May 1966. "Erect herb ca. 25 cm tall. Perianth yellow-orange."

Polygala subtilis has much smaller (alae ca. 1 mm long) white flowers on pedicels 0.2-0.3 mm long. Polygala microspora Blake also has considerably smaller flowers and persistent bracteoles, while P. saprophytica Chod. ex Grondona is smaller (11-15 cm tall) with broader (1 mm) leaves, longer racemes, 5-7-lobed carina, and alae shorter than the carina. Actually,

P. vitellina has much the general aspect of P. tenuis DC. (with much more prominent 7-lobed crest and relatively narrower alae only $2/3$ as long), with seeds as in the glabrous element of that species (vide infra). Closer still is P. herbiola St. Hil. & Moq., with pinkish flowers, carinal crest of ca. 4 pairs of lobes up to 1.3 mm long, and puberulous seeds. The latter species was moved by Chodat to the Trichospermae, having been previously placed by Bennett near P. tenuis; Chodat noted that the floral details are like those of P. longicaulis H.B.K. and its allies, but the seeds are anomalous in this relationship. Polygala herbiola has been collected several times in Goiás and the Distrito Federal by Irwin and his colleagues (5179, 11474, 12388, 12431, 13295) and may be the closest relative of P. vitellina.

POLYGALA TENUIS DC., Prodr. 1: 329. 1824.

Chodat (using Greek letters only) distinguished several varieties of this rather widespread species by flower color and robustness of habit; the salient specific feature is the small estrophiolate seed. Among the recent planalto collections, several have completely glabrous seeds (Irwin, Souza, & Reis dos Santos 9758 and Irwin, Grear, Souza, & Reis dos Santos 13497 p. p., from Serra dos Cristais, Goiás; Irwin, Souza, & Reis dos Santos 10233 p. p., from Gama, Distrito Federal; Irwin, Souza, Grear, & Reis dos Santos 17219, from 75 km south of Xavantina, Mato Grosso), but are otherwise indistinguishable from the more commonly collected material with puberulous seeds. Without examination of the types of the Chodat variants, it does not seem advisable to describe the glabrous-seeded form; in two of the collection numbers (10233, 13497), individual sprigs have either glabrous or puberulous seeds. In Chodat's arrangement, the seed feature would key collections such as 9758 to near P. subtilis H.B.K., P. microspora Blake, and P. saprophytica Chod. ex Grondona; all these species have smaller flowers and/or shorter leaves.